IPY INTERNATIONAL POLAR YEAR (IPY) 2007

Austrian Navy Lieutenant Karl Weyprecht after a cruise in the Barents Sea aboard TEGETHOFF became convinced that scientific study should take preference over exploration and began a campaign that led to the International Polar year (IPY) from 1882-1883. This was followed by a second polar year during the years 1932 to 1933 that was significantly reduced due to the worldwide depression during these years. The third IPY evolved into the International Geophysical Year (IGY) 1957-1958 with a broader geographical scope.

June 24-26 an international symposium ,ÄúPerspectiives of Modern Polar Research,,Äú was convened in Bad Durkeim, Germany to celebrate the 175th anniversary of the birth of Georg von Neumayer. Arising from the participant discussions was a strong consensus that a program should be formulated to commemorate the 125th anniversary of the IPY (International Polar Year) in 2007. The Neumayer Declaration adopted was:

A 125th year IPY program be initiated using new and present technologies to determine:

1. Causes and effects of climatic variability--air/sea/ice interactions
2. Lithosphere dynamics--evolution and history of crust and sedimentary cover

SCIENTIFIC RATIONAL:

It is clear that a complex suite of significant, interrelated, atmospheric, oceanic and terrestrial changes has occurred in the polar regions in recent decades. These events are affecting every part of the polar environment and are having repercussions on society. Solar variations are also believed to influence climate through the formation of high altitude clouds, influencing the ionosphere of Earth, variations in solar output as recorded in the Holocene sediments and other effects. Polar contributions to and the effect of global climate change are still a matter of conjecture, and to a large extent so are the extraterrestrial contributions.

GOALS:

In a similar thrust to both the IPYs and IGY the goal would be to obtain synoptic measurements for studying large scale processes at high latitudes . The hypothesis is that if scientific processes can be summed, simplified and synthesized from a great number of stations over a broad geographic region they will be easier to understand and predict. Observing systems would ideally be in place over a number of years to separate annual variability from seasonal. A partial list of goals might include:

- Separation of the profound changes in the polar regions between anthropogenic effects and natural fluctuations.
- The environmental paleohistory/tectonics of the high latitudes as outlined by JEODI.

- The terrestrial solar coupling via coordinated set of observations of the largest scale the solar generated events that affect life and climate on earth.
- Reconstruction of the detailed history of polar ice sheets, identifying geological controls to ice sheet behavior
- Polar oceanic and terrestrial ecosystem studies of the structure and processes of the environment from the sea floor to space and their relationships with and climate change.
- An end-end modeling capability of solar terrestrial physics so that physical processes can be tracked throughout the entire Sun-Earth system.
- It should be noted that polar and space research presents exceptional opportunities to integrate educational outreach into research projects by communicating the unique results to the interested scientific community and to all peoples of the Earth.

APPROACH:

Require an integrated, holistic system approach encompassing a wide range of disciplines and new and improved technologies for long term measurements on the seabed, in the water column and space over all seasons with new platforms of which the proposed European research ice breaker (Aurora Borealis) with dual moon pools, dynamic positioning and scientific drilling capability is a prime example. Coordination and collaboration with international scientific organizations such as AOSB, SCAR, IASC, SCOSTEP (Scientific Committee on Solar-Terrestrial Physics) and especially their program on Climate and Weather of the Sun-Earth System (CAWES), and the IHY community will be necessary.

Interdisciplinary boundaries may be a fruitful area of research. Educational outreach, in both formal and informal settings to improve science competency and citizenry awareness and information of polar and space sciences will be a vital component

WHY 2007? And PROGRAM COMPONENTS:

As currently envisioned the program will have three main thrusts each of which is broad in scope. The next maximum in solar activity will occur in 2010. A coordinated campaign of observations beginning in 2007 and ending in 2010 would be able to sample the Earth response for essentially the full range of solar input, from near minimum activity to solar maximum. In addition a new fleet of scientific instrumentation in space including Solar Terrestrial Relations Observatory (STEREO), SDO (Solar Dynamics Observatory )and Solar B will be available providing unprecedented observations of the heliospheric inputs. These data, coupled with comprehensive terrestrial datasets will provide significant new insights into the Sun-Earth connection. It has been proposed to implement CAWES in the period of 2003-2007 to foster a scientific approach to understanding the short term (Space Weather) variability of the integrated solar-terrestrial environment (SCOSTEP, 2001). In a similar vein an International Heliophysical Year (IHY) has been proposed for 2007 to obtain a coordinated set of observations to study at the largest scale the solar generated events that affect life and climate on Earth.

The IODP (Integrated Ocean Drilling Program) will commence in October, 2003 with field operations being launched in subsequent years with the Arctic having a strong potential to be a focal point. The Aurora Borealis will be in the field with unprecedented multi-discipline all season data collection capacity and a scientific drilling capability.

The SEARCH program focused on the changes in the Arctic and their potential impact on the Earth including human, social and economic well being will be underway.

ACTION:

Your support and interest are needed now. Near term opportunities are a Special discussion session with presentations at the World Space Congress(COSPAR) in Houston the morning of 17 October. See details at http://www.copernicus.org/COSPAR/COSPAR.html. The session will consist of several invited talks and a 30 minute open discussion to receive community input. A community forum will also be scheduled for the winter AGU to receive community input. The purpose of these two meetings is to identify volunteers to identify scientific issues and construct a scientific outline for further discussion at a session scheduled for the EGS-AGU-EUG Joint Assembly 7-11 April 2003, Nice, France. From this point organization issues, identified key players and an integrated science plan will be constructed for presentation to ICSU. Your support is essential to make this opportunity a reality. Responses will be collected and presented to the appropriate funding agencies as a measure of community support. Please log in to the IHY web site at http//ihy.gsfc.nasa.gov with an expression of interest and any ideas for the program. This will enable us to include you on upcoming events as well as news.

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